

## DRS Celebrates 30th Anniversary During NIH Centennial

### Four DRS Branches Help NIH Scientists Plan, Perform, and Report Research

Robert A. Whitney, Jr., D.V.M.,  
Director

As NIH begins its centenary year in October 1986, the Division of Research Services is nearing the end of its 30th anniversary year. Joining with the other Bureaus, Institutes, and Divisions in celebrating NIH's myriad contributions to human health, we also celebrate the constant support DRS personnel have given to the research that produces those

contributions—support ranging from outright scientific collaboration to routine supplying of requisites for research.

The Division of Research Services began operations in January 1956 under its first Director, Chris Hansen, "to centralize and broaden services in support of research, in order to meet the needs of an expanding NIH program" (First Annual Report).

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**DRS's Tenth Anniversary.** DRS Chief Chris Hansen and his principal staff members gathered in 1966 for this tenth anniversary photograph in the NIH Record. Seated (l to r): Edwin Lamphere, Chief, Environmental Services Branch; Dr. William DeWitt, Associate Branch Chief for Laboratory Resources; Mr. Hansen; Hugh Connolly, Associate Branch Chief for Engineering Resources; John G. DuBay, Executive Officer. Standing: Howard Biggs, Chief, Research Facilities Planning Branch; Ross Holliday, Chief, Plant Engineering Branch; Dr. Robert Byrne, Chief, Laboratory Aids Branch (now Veterinary Resources Branch); Dr. Malcolm Ferguson, Chief, Medical Arts and Photography Branch; Dr. Lester Goodman, Chief, Biomedical Engineering and Instrumentation Branch; Jess A. Martin, Chief, Library Branch.

### NIH Library Begins 84th Year of Service to Intramural Programs

The NIH Library in 1956 was a unit of the Scientific Reports Branch in the Office of the Director, NIH; the entire branch was moved that year from the Office of the Director to the newly formed Division of Research Services. The Library was raised to DRS Branch status in 1960.

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### VRB Provides Services to Researchers Using Animals

The Veterinary Resources Branch (VRB), DRS, was originally called Laboratory Aids Branch (LAB). The name was changed in 1972 to express the Branch's principal functions more clearly.

In 1956, when DRS was formed, the Laboratory Aids Branch had five sections: Animal Production, Animal Hospital, Instrument (later the nucleus of the Biomedical Engineering and Instrumentation Branch, DRS), Laboratory Glassware Preparation, and Media (tissue culture and bacteriologic media preparation for laboratory use). The Chief was Dr. Willard H. Eyestone. The Branch had previously been part of the Office of the Director, NIH, since 1948.

Glassware and media activities were transferred to the Environmental Health and Safety Program, DRS, in 1976, leaving VRB focused on laboratory animal science and medicine.

The Animal Production Section (headed in 1956 by Dr. George Jay) was the ancestor of the current Small

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### MAPB Helps NIH Report Research Findings and Inform Public

In 1956, Medical Arts Section and Photography Section were two of the six components making up the Scientific Reports Branch in the Office of the Director, NIH. That year the entire Branch was transferred to the newly-formed Division of Research Services. The four other components

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**DRS 1986.** During DRS's 30th anniversary year, the Division's varied research support activities were coordinated by Dr. Robert A. Whitney, Jr., Director (front) and (l to r) Dr. Stephen Potkay, Chief, Veterinary Resources Branch; Dr. Murray Eden, Chief, Biomedical Engineering and Instrumentation Branch; Jane Leitch, Executive Officer; Carolyn Brown, Chief, Library Branch; and Ron Winterrowd, Chief, Medical Arts and Photography Branch. Since this picture was taken, Dr. Potkay has accepted an assignment with the Pan American Zoonoses Center, PAHO, in Buenos Aires, Argentina. Dr. James F. Harwell, Jr., is now Chief, Veterinary Resources Branch.

### BEIB Meets Engineering, Instrumentation Needs of NIH Labs

The Biomedical Engineering and Instrumentation Branch, DRS, was established in 1960 under the name Instrument Engineering and Development Branch (its current name was adopted in 1965). The Branch was developed from the Instrument Section

of the Laboratory Aids Branch, DRS.

In 1956 the Instrumentation Section had two units: Engineering and Fabrication. The annual reports of the Instrument Section from 1956 to 1959 show the expanding role that led so quickly to Branch status in the new Division. The first reports merely list a few of the most significant of the 4000-plus instrumentation projects performed each year at the request of investigators. The 1958 report distinguishes 178 projects among these

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# DRS Celebrates 30th Anniversary

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DRS now has four branches: Biomedical Engineering and Instrumentation (BEIB), Medical Arts and Photography (MAPB), NIH Library, and Veterinary Resources (VRB). Since they perform essential roles in the planning, performance, and reporting of biomedical research, they had all existed as NIH units under various names for many years before 1956. The NIH Library was established in 1903 as the library of the Hygienic Laboratory. Since the Laboratory's work was based on the example of Pasteur and Koch, animal experimentation was included from the first, and historical records show that good treatment of the animals was emphasized early on. The Laboratory had an artist on staff at least by 1913. By then, scientific instruments were probably already being modified or created for the particular needs of various labs.

DRS originally had five branches, formed from units of the Office of the Director, NIH: Laboratory Aids, Scientific Reports, Biometrics, Plant Engineering, and Sanitary Engineering.

The four current DRS branches developed from two of the original branches. VRB and BEIB were derived from the Laboratory Aids Branch; MAPB and the NIH Library came from the Scientific Reports Branch.

BEIB developed from the Instrument Section of the Laboratory Aids Branch. Because the section was providing investigators with increasingly varied and more sophisticated instrumentation services, it was elevated to branch status in 1960 as the Instrument Engineering and Development Branch. With more professional engineers and physical scientists on its staff, the new branch increased its collaborative research while continuing its technical services

to NIH investigators; its name was changed to Biomedical Engineering and Instrumentation in 1965 to express its broader functions.

The Laboratory Aids Branch—minus BEIB—was renamed Veterinary Resources Branch in 1972, to reflect its primary functions of providing NIH investigators with animal models and the facilities and services related to using them.

The Library Branch and the Medical Arts and Photography Branch were formed in 1960 when the Scientific Reports Branch was dissolved; its other sections (much involved with Institute information offices) were transferred to what is now the Office of Communications, OD.

NIH intramural programs developed and expanded rapidly in the years after DRS was formed. The Division's three other original branches became the nuclei of NIH Divisions: the Division of Computer Research and Technology (from Biometrics Branch, by then renamed "Computation and Data Processing Branch"), Division of Engineering Services (from Plant Engineering Branch and two later DRS branches), and Division of Safety (from Sanitary Engineering Branch and later DRS components).

The various reorganizations have given DRS a sharper definition and goal. Beginning in 1962, DRS Annual Reports divided the Division's programs into two broad classifications: "Programs in direct support of research" and "Programs related to NIH facilities and environment." Since the 1981 reorganization, DRS has consisted entirely of branches whose activities had always been listed in the first category: direct support of research. DRS and its branches support research projects throughout their planning (NIH Library),



Dr. Roger D. Estep, Director of DRS November 1971-July 1972 (right), held a series of meetings with DRS employees early in his tenure. Here he is chatting with (l to r) Mary Richards, Glassware Section, Laboratory Aids Branch (now a section of the Division of Safety, ORS); Hubert Lee Gore, BEIB (deceased); Kathy Clifford, NIH Library; and Margaret Clark, VRB. Dr. Estep resigned to become vice-president for development and university relations at Howard University.

performance (VRB, BEIB), and reporting (MAPB). Many NIH research projects require the support of all four branches.

Under the direction of Chris Hansen and my other predecessors as Director of DRS—Drs. William B. DeWitt, Dr. Roger D. Estep, and Dr. Joe R. Held—the Division has made many changes and adaptations to match changing needs in biomedical research. As NIH enters its second century, ready to follow the trail of discovery toward answers to mankind's greatest health problems, we in DRS are pledged to continue helping make that trail as smooth and straight as we can.



Assistant Surgeon General Joe R. Held was Director of DRS from 1972 to 1984. Dr. Held had also served as Chief of the DRS Veterinary Resources Branch (1969-72), and as Acting Director, DRS. Here he is shown in 1975, the year he was named Chief Veterinary Officer, USPHS. Dr. Held is now Director, Pan American Zoonoses Center, PAHO, Buenos Aires, Argentina.



Dr. William B. DeWitt, appointed Director of DRS in June 1969, died August 8, 1971 while serving in that post. An exhibit honoring him was placed in Building 10 near the NIH Library in October of that year. Dr. DeWitt, a parasitologist who came to DRS from NIAID, served as the Division's Scientific Director and Associate Director for Laboratory Resources before becoming Director.



National Secretaries Week, 1976. DRS and some other BID secretaries gathered for a National Secretaries Week seminar on modern management. In the left foreground are Dorothy Windham, secretary to Executive Officer Levi Carter, and Jean Holland, secretary to Dr. Joe Held, Director.



# Biomedical Engineering and Instrumentation Branch

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and highlights nine especially significant ones, including the heart-lung bypass machine developed for Dr. Glen Morrow of the National Heart Institute. In 1959 Dr. Fred Alt, an electrical engineer specializing in electronics and radiation, joined DRS as Instrument Section Chief. His initial report stressed the growing importance of electronics in biomedical instrumentation, and collaboration with the DRS Biometrics Branch on making instrument outputs available to analysis by digital computers.

The following information on some important events in BEIB's history was culled from annual reports and other sources. Space limitations permit listing only a few samples of the engineering and instrumentation advances described.

## 1960-1964

The new Branch's two objectives were stated as: to provide NIH intramural scientists with unique, noncommercial instruments and instrumentation systems, and to provide leadership in this rapidly advancing field, both inside and outside NIH. Two years later they were restated to stress rendering engineering and technical support to the intramural scientists through consultation and advice on engineering methods and instrumentation systems applicable to NIH research, as well as design, construction, and maintenance of nonstandard instruments.

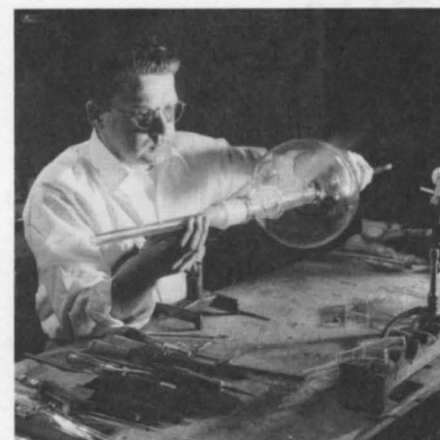
In the first year, staff was increased somewhat, and plastics fabrication began. The first medico-engineering team formed: a Branch electronics engineer with biologists of NINDB. Within two years three new research team projects existed with investigators of NINDB, NIMH, and

NIAMD. Coursework by staff increased greatly: postgraduate, college, and technical school. Instruments made ranged in size from a miniaturized wireless microelectrode drive (small enough for the skull of a hibernating ground squirrel) to a slide projector that projected tissue slides at 94x magnification onto a six-foot desk top.

Bioengineering support requests from the Institutes multiplied; the Branch divided such projects into (1) biochemical analysis, (2) physiological monitoring and clinical practice, (3) automation and computer applications. The plastics facility developed new synthetic materials and

processes for prosthetic devices, artificial organs, and electrodes. Contract services on engineering/fabrication projects increased, under guidance and supervision of Branch engineers. Second generation heart-lung bypass machine development was handled this way.

Work began on polymer implant device development. Two new satellite shops were established: NIDR and NIMH (Saint Elizabeths Hospital). The Branch was much involved in preparing the new Clinical Center surgery. A preventive maintenance section was inaugurated and the Clinical Center satellite shop expanded. Instrument loans to NIH



Glassblowing in 1956. DRS's first Director, Chris Hansen, had a collection of photographs taken during 1956 to illustrate DRS activities. This striking picture of glassblower Warren Foster at work has been reproduced many times since.



Heart Assist Device. BEIB engineer Marshall Turner holds an implantable left ventricular heart assist device developed by BEIB in 1966 for the National Heart Institute. The device was tested in calves. John Fogel (left) and Harold Tipton (center) also participated, as did Howard Metz and John Boretos. Boretos adopted spandex (better known for use in girdles) for this and other biomedical device uses.

laboratories began modestly with testing equipment obtained from surplus.

## 1965-1969

The Branch was renamed Biomedical Engineering and Instrumentation. Dr. Alt transferred. First application of segmented polyurethane to biomedical use, initially as a pump chamber in a left-heart assist; many other applications followed in later years. Branch staff developed the second central dialysate supply system in the United States, for the Washington, D.C., Veterans Administration Hospital. A pilot research contract was signed with Beckman Spincor Corporation for service and consultation on demand.

In 1966 Dr. Lester Goodman was named Chief. The Branch was reorganized into a structure close to the current one. Technical services (primarily those under the Service and Supply Fund) were placed under an Assistant Chief for Technical Services and divided into the Instrument Fabrication Section and Systems Maintenance Section. The engineering sections were designated Electrical and Electronic Engineering, Mechanical Engineering, and Chemical Engineering. A special category of Branch engineers was established: a small group of senior professionals, staff consultants in the Office of the Chief, assigned to conduct and oversee comprehensive, long-range projects.

Technical Services had about 13,000 assignments in 1966; the engineers engaged in about 400 research and development projects and in more than 400 man-days of professional consultation.

"This year has seen especially noteworthy original contributions in the areas of artificial organs, materials, laser technology, mechanization, and automation," said the 1967 Annual Report. "The growing reputation of NIH as a national focal point for engineering in medicine and biology has contributed to a remarkable increase in the number of high level professional applicants." In 1969 the Branch had to report that Federal budget and personnel restrictions were



BEIB Veterans. Thirty-year pins and certificates were presented in 1970 to six BEIB employees. Shown (l to r) are Pete Flavin, Grant Riggle, Frank Anderson, Julian Holland, Kennie Bolen, DRS Director Dr. William DeWitt, and BEIB Chief Lester Goodman. Jesse Rowland was not present for the picture.



On the Button. Howard Metz, now BEIB Assistant Branch Chief for Scientific Equipment Services, was a staff engineer in 1966 when he pushed the button to start this artificial kidney center for hemodialysis therapy at the VA Hospital in Washington, D.C. He and Homer Chalifoux (right) designed the system, built by BEIB's Instrument Fabrication Section.

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# NIH Library

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The Library itself dates to 1903, when the Hygienic Laboratory (NIH's predecessor organization) was about to move from its meagre quarters on the fourth floor of the Butler Building on Capitol Hill to its own new building on five acres at 25th and E Streets, NW. A 14-by-19-foot room in the new building was designated as the library (and visitors' waiting room!). Edward K. Foltz, "a young man with no library training but considerable journalistic experience," was named acting librarian in addition to his other duties as a clerk. He served as librarian for 10 years. The collection began with books gathered from the laboratories, indexed, and shelved by subject.

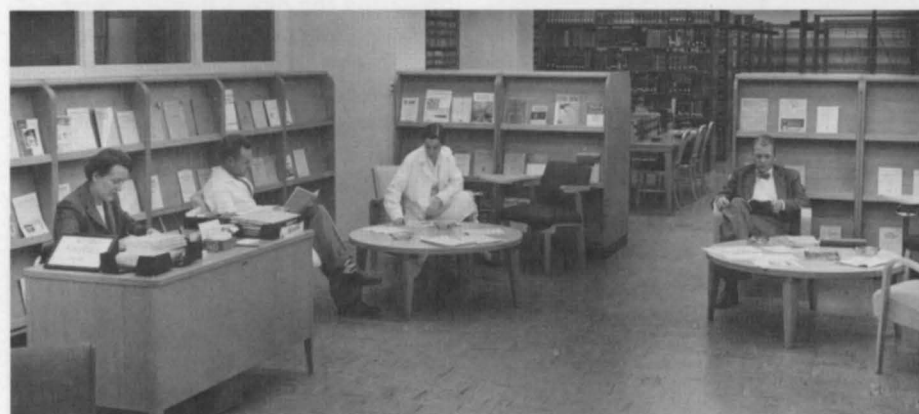
The library soon began to grow as the Hygienic Laboratory's scope widened. When two new wings were added to the building in 1907, the library was moved to a larger room. Again in 1920, it was moved to even larger space in a new building. Mr. Foltz was replaced in 1914 by Dr. Murray G. Motter, a physician with experience as a compiler of pharmaceutical abstracts. The first translator was added to the staff in 1920: Walter D. Cannon, a bacteriologist. Dr. Motter retired in 1924; his replacement was Carrie Meyers, who had been his assistant for years. The Hygienic Laboratory became the National Institute of Health in 1930. Four years later the library moved for a third time, to a new administration and library building on the same grounds. It now had 18,000 bound volumes and was receiving 347 periodicals; the staff numbered four persons.

During Christmas week of 1939 came the fourth move: to Building 1 on the new NIH campus in Bethesda. The NIH Library occupied 7000 square feet on the second floor, both in the front and in the south wing. A five-year period of phenomenal growth for the Library was beginning. Shortly after the move, however, a water pipe burst in the cafeteria kitchen in the south wing of the floor above, flooding boiling water down on the pathology section of the stacks. The contractor was forced to reimburse NIH for the expense incurred. The Library has suffered several floods, including periodic water leaks into the monograph area, to the present day. Most fortunately, damage has been mainly to walls and carpet, not to books.

In the rapid military buildup following Pearl Harbor, the Combined Chiefs of Staff took over the headquarters building of the Public Health Service at 19th Street and Constitution Avenue. Many PHS personnel were transferred to the NIH campus early in 1942, bringing along the PHS Library of 17,000 volumes and 10,000 pamphlets. Carrie Meyers had retired as NIH Librarian in 1941, and one of her assistants was acting



NIH Library: Location No. 5. Journal area of the NIH Library in its 1939-1953 location, on the second floor of Building 1. It had previously been at four locations in the Hygienic Laboratory buildings in downtown Washington.



NIH Library: Location No. 6. Journal area of the NIH Library in its 1953-1968 location, fifth floor of the Clinical Center. The picture was taken around 1955. The library moved in 1968 to its present location.

chief. Miss Margaret Doonan, who had been at the PHS Library since 1919, came to NIH along with her library, and was named NIH Librarian shortly after. She was the first trained librarian to hold the position.

After the war, the Library distributed duplicates of major journals including *JAMA* and *Science* to war-devastated libraries in Europe, and obtained many foreign journals missing from the war years. The PHS personnel returned downtown, but the PHS Library collection remained. The situation was unsatisfactory to both parties. The two collections were combined, but when DRS was formed in 1956 the two catalogs were not yet completely integrated, and return of the PHS books to PHS headquarters was considered a "decided possibility." The issue seems to have been resolved during the next few years in a large-scale withdrawal and transfer of volumes following the establishment of the National Library of Medicine in the Public Health Service.

A small translation operation in the Office of the Director, NIH, that had existed since 1938 was expanded in 1946 and designated the Translating Office. In 1950 both the Library and the Translating Office became components of the Scientific Reports Branch in the Office of the Director; translation services were not yet part of the Library. That year the Translating Office had ten translators and seven clerical assistants, its highest staffing level ever.

NIH personnel increased from 897 to 2,301 during the four years from 1945 to 1949. The south wing of the Library area was taken for other use

and the collection was drastically winnowed in 1948. Additional space was lost in 1950 to the expanding Medical Arts Section. Even so, the Library held 67,000 volumes and had a staff of 15 in 1950, when Scott Adams became Library Chief. Mr. Adams came from the Armed Forces Medical Library, where he had been chief of the acquisitions unit and then Acting Librarian.

In 1953 came the "long-awaited move" to the fifth floor of the new Clinical Center. The books were moved directly from the shelves to a large collection of carts borrowed from area libraries and taken to the Building 1 loading dock, where the carts were put on trucks. After the short trip to Building 10, the carts were emptied directly onto the waiting shelves. The move was made in seven eight-hour workdays, with no dislocation of the collection and minimal disruption of loan and reference service.

By the end of 1953 the Library had more than 73,000 bound volumes and was receiving more than 1,200 professional journals. It was housed in modern quarters that seemed roomy at the time, and was served by a staff of more than 20 persons.

(The preceding information was derived from "A History of the National Institutes of Health Library: 1901-1952," (M.A. thesis) by Elizabeth H. Thomas, and a 1965 journal article, "Twenty-five Years of Translating Service at NIH," by Jess A. Martin, Chief of the Library Branch, DRS, *et al.* The following information was derived from DRS annual reports and other sources.)

## Them Was the Days: The NIH Library

Champ Carter was an NIH Library employee when the Library moved from downtown to Building 1 on the NIH Bethesda campus in 1939. He later recalled that Miss Carrie Meyers, the Librarian, asked him to have the NIH carpenter make a large, standing-height work table for the processing room in the new library facilities. Mr. Carter ordered a table 5 feet by 9 feet in size and 30 inches high. After it was installed, he and some coworkers often cleared it during their lunch break and played ping pong on their regulation-size table.



Library Photocopying. DRS emphasized photocopying in its 1966 brochure; the service was only a few years old, and self-service was not yet available.

## 1956-1959

When the Scientific Reports Branch (including the Library) became part of DRS in 1956, the Translating Unit became part of the NIH Library.

The Army Medical Library was renamed the National Library of Medicine in 1956 and transferred to the PHS, at a time when the PHS Library collection was still housed in the NIH Library. The next year, NIH Library collection responsibilities were reviewed in relation to the NLM, the HEW Library, and libraries of other Federal programs. A large-scale withdrawal and transfer program began. Within NIH, comprehensive bibliographies on selected subjects were prepared and distributed.

Congress had just established a broad program of translating and disseminating Soviet publications in biology and medicine, to be run by the NIH. NIH Librarian Scott Adams was the coordinator. The first two issues of *Biochemistry* and *Bulletin of Experimental Biology and Medicine* were translated and distributed to 300 American medical libraries that year, and arrangements made for a contract on translating six more journals.

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# Medical Arts and Photography Branch

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of Scientific Reports Branch were the Library Section, Editorial Section, Publications and Reports Section, and Special Events Section (which was transferred out of DRS to the NIH Office of Research Information in 1958).

Medical Arts and Photography Branch began in 1960. Earlier that year the Library Section was raised to DRS Branch status, and the Editorial Section and Publications and Reports Section were also transferred to the NIH Office of Research Information. With these changes, the Scientific Reports Branch had only two sections, Medical Arts and Photography, and this became the Branch name. Since graphic arts and photographic services are necessary in biomedical research, NIH staff were providing them long before the Scientific Reports Branch was formed in the 1940s. For example, the Hygienic Laboratory had an artist on staff in 1913 and possibly earlier.

Early DRS Annual Reports stated the functions of Medical Arts Section as "designs, constructs, schedules and ships research exhibits; prepares general, technical, and medical illustrations for use in lectures, scientific publications, and exhibits, and for administrative, informational, and teaching purposes; develops visual and functional tools, such as plastic and wax models, to assist the scientific staff at NIH." Photography Section's role: "provides black-and-white and color photographs, photomicrographs, slides, transparencies, and motion pictures to illustrate, document, and validate research, both in the presentation of scientific reports and in the provision of general information concerning NIH research accomplishments; investigates potential photographic techniques that may contribute to the solution of special research problems; designs special photographic equipment or adapts existing types to fit specific production or research problems."

Space limitations permit only a few examples of the many special projects

described in annual reports, and of the frequent improvements in equipment and techniques to meet the needs of MAPB's customers in research and communications. The following information was derived from DRS Annual Reports and other sources, including the memories of several MAPB staffers.

## Before DRS

In 1949, when Walter Ashe joined Medical Arts Section, it had eight full-time employees: one supervisor, one plastics specialist, and six others divided between statistical draftsmen and artist-illustrators; there was no secretary. They were located in rooms 209 and 211 on the second floor of Building 1. The NIH Library occupied most of that floor. Around 1955 the Section, with several more employees, moved to the ground floor of Building 1.

The Photography Section was located in Building T-6, a temporary building on the site of Building 31. It had two units, called Black-and-White and Color.

## 1956-1959

In 1956 Inez M. Demonet was head of Medical Arts Section and Roy Perry was head of Photography Section. That year Medical Arts prepared 3,632 charts, graphs, tables and maps; 24 exhibits; 320 nonclinical illustrations; design and format for 25 publications; 285 drawings of surgical procedures, pathological specimens, and anatomic subjects; and 34 moulages of pathological specimens. Photography Section's black and white work products included 139,114 prints, 24,393 slides, and 51,194 negatives; plus 8,224 color slides and 14,370 color transparencies; 40,313 photostats; and 18,285 feet of motion pictures. Three Medical Arts exhibits won four awards; the one that received two awards was "The Malignant Carcinoid Syndrome," prepared for the National Heart Institute. Nineteen Photography Section employees shared a \$1200 Superior Work Performance Award. Four members of the Photography Section moved into the new photolab

quarters on the B1 level of Building 10 during 1956, and the entire Section moved there in 1957.

At the end of 1956, Taft S. Feiman was named Chief of Scientific Reports Branch; he had been managing editor of *Public Health Notes*.

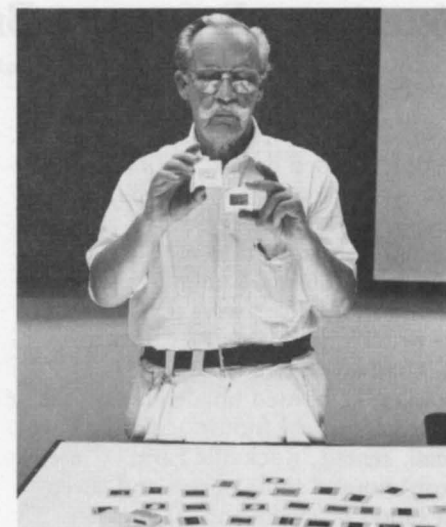
Work requests to both sections increased annually during these years, bringing problems with staffing and space. Species preservation in plastic was a new and rapidly expanding activity in Medical Arts. The Section also developed the plastic components of an artificial heart pump for NHI. Exhibits design and production was a major activity. Medical Arts Section also took care of storing, shipping, and record-keeping of Institute and Division exhibits, although it had no formal responsibility for these services. Many exhibits had changeable parts and were used by various NIH and PHS components. Older exhibits were frequently updated.

The first medical illustrator was hired during this period, and stationed on the fifth floor of Building 1, near the scientists who needed his services. In 1958 the Section (now with 17 employees) moved to the A wing on the first floor of Building 10, near the Clinical Center Director's office. The Section also received additional space in the sub-basement of Building 1 for exhibits construction and storage. The Section announced what appears to be its first portable exhibit "designed especially for transporting by airplane." Information photography was expanding rapidly in the Photography Section: for example, 4000 color slides in 1957 for Clinical Center nurses training. Motion picture work included not only filming, but editing film produced by investigators, for example, Dr. Carlton Gajdusek's footage on Kuru fever.

## 1960-1965

The name of the Branch was changed to Medical Arts and Photography in December 1960.

It had two sections; James A. King was Acting Chief. The first MAPB



Arthur F. "Art" Moore, MAPB Branch Chief from 1971 to 1981, and previously head of the MAPB Motion Picture Section. Art died in October 1985. This picture appeared in the DRS Annual Report of his last year at NIH.

Chief was named in 1961: Dr. Malcolm S. Ferguson. The two branches were still physically separated, and the new Branch Chief's office was in a third location, on the fifth floor of Building 10. Inez Demonet stepped down as Section Chief and began serving as Fine and Applied Arts Consultant, with an office near the Branch Chief's. She was involved especially with the interiors of the new buildings on campus. George Marsden became Medical Arts Section Chief.

The pattern of ever increasing workloads continued. For example, Photography Section had 1,669 additional work requests in 1960, an increase of 18 percent over the previous year. The increase next year was 28 percent. Medical Arts requests increased 8 percent in 1961. Methodological research projects were especially prominent in the Photography Section and the Plastics Unit of Medical Arts Section.

Silk screening was added to Medical Arts Section's programs. The Drafting

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Artists and Models. MAPB staff sometimes appears as models in brochures and posters produced by the Branch. Walter Ashe portrayed himself in a 1960 DRS brochure, striding off to bring artistic aid to some NIH component. He reappeared 25 years later in an NIADDK poster as a thoughtful urologist sharing his wisdom with colleagues.



Road Show. Walter Ashe and Ron Winterrowd, with help from MAPB secretary Joanne Brown, obviously made sure that their exhibit on mental retardation research was mounted exactly as planned. Or something. The time was the early 1960s.



# Veterinary Resources Branch

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Animal Section. The Animal Hospital Section (headed by Dr. William I. Gay) was the ancestor of Veterinary Medicine and Surgery Section and the Animal Center Section.

Virtually all small animals used at NIH in those years were produced by the Branch. Buildings 14A through 14D had come into use in 1954. Building 12 housed (inadequately) the "general purpose mouse" colony. The small, rented "Rockville Farm" (Casey Farm) housed some horses and sheep for blood products and 40 dogs on evaluation studies.

Some of the major events in the Branch's history, gleaned from DRS Annual Reports and other sources, are the following:

1956. Building 14E, constructed to house monkeys for polio research, is opened for use. Small animal production: 948,582. Demand exceeding production capacity and shortages foreseen. Hospital Section provides facilities for 300 experimental surgical procedures; quarantine, conditioning, and issuance of many dogs, cats, and primates; large animal holding; and routine tuberculin testing for NIH groups holding primates. Dr. Jay assists the National Research Council on genetic and husbandry standards.

1957. Comparative Pathology Section transferred from the National Cancer Institute to LAB. Staff includes Dr. Anton M. Allen. LAB inaugurated a charge-back system (fee for service) for animals supplied by Animal Production Section. Buildings 14F and 14G completed, but used for offices.

1958. First Assistant Branch Chief hired, Dr. Preston Holden. Dr. Gay reports Rockville Farm is "rapidly becoming unsuitable for NIH needs."

1959. Drs. Eyestone and Jay transfer. Dr. Holden becomes Chief of LAB; Mr. Samuel Poiley Chief, Animal Production Section. Genetic Research Unit established under Dr. Donald W. Bailey. Regular skin graft genetic testing of rodents begun. Birth of LAB colony's 10 millionth mouse. (DRS Annual Report does not describe the celebration.)

Lab staff much involved in first Washington meeting of Animal Care Panel (soon renamed American Association of Laboratory Animal Science—AALAS).

1960. NIH purchases 513-acre farm near Poolesville, MD as site of NIH Animal Center. Temporary alterations to existing structures permit transfer of some animals from the Rockville Farm. Mr. Poiley transfers. Dr. Charles McPherson becomes Chief, Animal Production Section, which now contains more than 60 distinct breeding colonies. First "Stock List" (precursor of NIH Rodent Catalog) issued, giving origin, known genetics, known morphology and physiological characteristics of each animal type in

the section. Richard Pierson and Damara Bolte start diet comparison studies—beginning of LAB nutrition research.

1961. Work begins on establishing germ-free and specific pathogen-free rodent colonies. Foundation colonies established in isolators. Design work for remodeling Buildings 14F and 14G for gnotobiotic use. Dr. Anton Allen named Chief, Comparative Pathology Section. Dr. James Ganaway, a microbiologist skilled in virology and bacteriology, added to Comparative Pathology Section for gnotobiotic needs and general colony monitoring.

1962. General purpose mouse colony in Building 12 closed, replaced by cesarian-derived general purpose colony in Building 14F. Comparative Pathology Section research increasing: Drs. Ganaway, Allen, McPherson identify *Bordetella bronchiseptica* as cause of most common pneumonia of guinea pigs, prepare a vaccine that is found effective. In Genetics Research Unit, Dr. Harold Hoffman replaces Dr. Bailey, who had transferred.

1963. Dr. Preston Holden transfers; Robert J. Byrne succeeds as Branch Chief. Dr. Gay transfers; Dr. Thomas Cameron named Chief, Animal Hospital Section. Dr. McPherson on leave to study gnotobiotic procedures. LAB and Research Facilities Planning Branch, DRS, establish joint laboratory animal science research and development program with emphasis on facilities and equipment for Building 14G gnotobiotic operations

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**Germ-Free.** Early devices for germ-free rodent-rearing arrive at NIH in the 1950s from the Lobund Institute at Notre Dame. Such devices were to be vital in the gnotobiotic programs of Lab Aids Branch and VRB, but at the time the NIH focus for pioneering germ-free activities was the DRS Environmental Services Branch, a predecessor of the Division of Safety.



**VRB Branch Chief, 1980.** Dr. Robert A. Whitney, Jr., was VRB Branch Chief from 1972 to 1984. This FY 1980 DRS Annual Report photo was taken outside the VRB surgery.



**Animal Hospital Section, late 1950s.** Dr. William Gay was the first Chief of the Animal Hospital Section (1954-1963). He is now Chief of the Animal Resources Program Branch, Division of Research Resources. His assistant in this examination was Barbara Penney, a medical biology technician at the time but now a veterinarian. Dr. Penney is an instructor in clinical medicine at the Virginia-Maryland Regional College of Veterinary Medicine, College Park campus.

## Them Was the Days: Veterinary Resources

A story Dick Pierson and Damara Bolte tell on themselves: "Richard the Rabbit" lived a pampered life for about five years during the 1960s as a pet in Damara Bolte's office in the Veterinary Resources Branch (then called Laboratory Aids Branch). Damara had asked for the baby rabbit when it was orphaned, and received permission to keep it. Richard even appeared with Damara in a photo accompanying an NIH Record feature story about her and her work. He was named in honor of Damara's coworker Dick Pierson. By coincidence, it was Dick (a supervisory animal husbandman) who sexed the animal when it was beginning its extra-protocol lifestyle near Damara's desk. Three or four years later a visiting animal technician from NIAID, Mr. Talley, surprised Damara by saying, "Call her Richard if you want to, but that rabbit's a female." So she was, but she remained "Richard the Rabbit."



**Damara Bolte and Richard the Rabbit.**



## Biomedical Engineering and Instrumentation Branch

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limiting its programs. Nevertheless, noteworthy contributions were made in prostheses, materials, laser technology, mechanization, automation, physiological monitoring, patient care, and physiological systems analysis. A small "loan pool" of scientific equipment had about 200 items (with about 60 percent out on loan at any given time), but was still composed only of surplus instruments refurbished by BEIB.

### 1970-1976

A new satellite shop opened in Building 37. The Chemical Engineering Section, in continuing work with NCI investigators, was devising pharmacokinetic models that provide a rational basis for chemotherapy, account for species differences in drug disposition, and extrapolate toxicity data from animals to humans.

Studies began on the role of fluid dynamics and mass transfer in development of atherosclerosis.

Scientific Equipment Rental Program (SERP) was officially inaugurated (operated by Systems Maintenance Section) in 1971, but was still small. With severe budget constraints, Institutes reduced instrument fabrication requests and increased repair requests; some fabrication staff were transferred to systems maintenance. BEIB surveyed surgical and patient care facilities for the Clinical Center, recommended steps to minimize electrical hazards. Strong emphasis was placed on analytic aspects of physiological systems related to pharmacokinetics in brain injury, hemodialysis, and cancer chemotherapy. Floor space in Building 13 was increased; a new satellite opened in Building 35. Purchase of new rental equipment for SERP began, from the program's profits; rapid expansion followed.

BEIB developed a device to permit growth of tumor cells to high density on semipermeable hollow fiber; it has continued to have a significant role in biotechnology. Several major BEIB projects matured and were put into clinical practice: mathematically derived chemotherapeutic protocols; clinical instrument systems based on video; noninvasive ultrasonic imagery to measure heart muscle dimensions. BEIB's recommended program of Clinical Center patient care instrument inspection and maintenance went into effect. NIH responsibilities under the "Florence Agreement" were delegated to BEIB; they concerned applications for duty-free entry of foreign-manufactured scientific apparatus acquired by nonprofit American institutions.

Significant advances were made in ultrasonic imaging of structure and function in the cardiovascular system. An increasing number of collaborative projects focused on observing, describing, and analyzing biological systems *in vitro* and *in vivo*, at levels

ranging from the biochemical through the cellular and tissue to the whole body. Work began on a miniature catheter capable of insertion into small convoluted blood vessels.

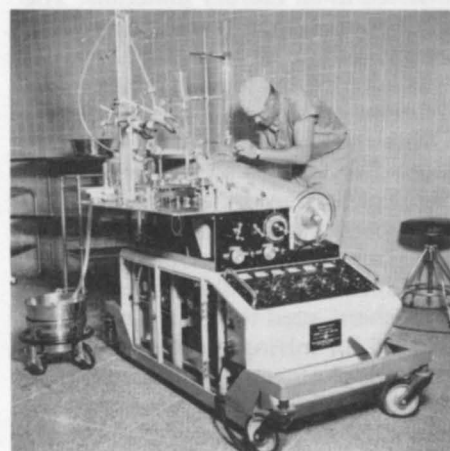
Dr. Goodman resigned in 1976 for a position in industry.

### 1977-1981

Dr. Murray Eden named Chief. The Applied Clinical Engineering Section was formed and located in the Clinical Center, to provide direct consultative clinical engineering support to research projects and to design, develop, and evaluate instrumentation for clinical and clinical research use. In the Branch, a probe using fiber optics to detect colorimetric changes was designed to permit pH measurements *in vivo*. Use of hyperthermia in treating inoperable neoplasms was enhanced by a programmable calculator that regulates and monitors control procedures for maintenance of stable elevated whole body temperatures. Work began on a custom PET scanner (Neuro-PET).

Nuclear magnetic resonance imaging research and development work began. Work began on analytical electron microscopy and image analysis, and on automated scanning electron beam x-ray microanalysis, in collaboration with staff of DCRT. Studies also began on secondary emission mass spectrometry. Applications of physiological pharmacokinetics to clinical work, which had begun in earlier years, moved into a major phase, particularly in the context of regional drug administration.

BEIB projects were begun to help less-developed countries improve their maintenance of medical and scientific equipment; projects funded by the U.S. Agency for International Development began in Egypt and have continued in the Caribbean and Mexico. SERP inventory reached 1,200 instruments in 1979; economies



**Early Heart-Lung Machine.** During the 1950s an important project of the Instrument Fabrication Section, Laboratory Aids Branch, was the Heart-Lung Bypass Machine they designed and built for Dr. Glen Morrow of the National Heart Institute. This DRS section was the nucleus from which the Biomedical Engineering and Instrumentation Branch was developed.

### Them Was the Days:

#### Biomedical Engineering and Instrumentation

Research into virus-related cancers during the 1960s included studies of oncogenic viruses secreted in the milk of mice from certain high-cancer mouse strains. As can be imagined, mouse milking presented problems. John Boretos of BEIB developed a semiautomatic apparatus—at the request of a visiting scientist in NCI—which enabled a single operator to milk two mice simultaneously using eight teat cups per mouse; the average yield was 1 ml per mouse (JNCI 38: 11-17, 1967).

All very serious work, but the topic of mouse milking seems to bring out the pixie in people. The device was referred to in BEIB as the "Semiautomatic Pneumatic Multiple Mouse Milking Mechanism." Mr. Boretos had some correspondence with the Dow

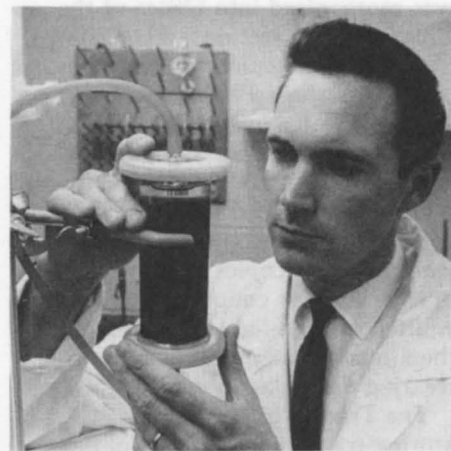
Corning Corp. about the device (he used one of their silicone rubbers in it); their initial reply included an "early prototype model" consisting of a tiny milking stool and bucket.

Shortly thereafter Mr. Boretos saw a brief item in *Chemical & Engineering News* saying "Mouse milk costs about \$9.25 per quart in Switzerland." The next month C&EN published his comment that the low price astonished him; he estimated that even with his semiautomatic device the cost would be more than \$1000 a quart, possibly as high as \$2000. A few weeks later another C&EN reader suggested the explanation: "mouse milk" is also the name of a highly refined white oil of very low viscosity and "evil odor" used for cleaning watch and clock works.

permitted a 33 percent reduction in rental fees. By late 1980, SERP's inventory was 1,820 instruments with a value of \$4.4 million; nearly 80 percent was in use. In 1979, BEIB sponsored its first NIH Consensus Development Conference, "The Use of Microprocessor-Based, 'Intelligent' Machines in Patient Care."

### 1982-1986

Three very different new imaging systems were under development in BEIB in 1982: Neuro-PET, the NMR imaging system, and the Electron Beam Imaging and Microspectroscopy Group's facility providing elemental maps of biological objects. The



**DRS Tenth Anniversary.** Dr. Robert Dedrick, now Chief, Chemical Engineering Section, BEIB, posed for a DRS tenth anniversary brochure in 1966. Perhaps his long-time interest in pharmacokinetics was already evident.

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**On the Verge.** A view of the Instrumentation Section, Laboratory Aids Branch, in 1959, shortly before it was raised to branch status as the Instrument Engineering and Development Branch. The branch was renamed Biomedical Engineering and Instrumentation in 1965.



## The NIH Library

Continued from page 4

Arrangements were also made for NIH translations of Russian papers to be selected by the editors of 40 American journals.

The number of Soviet biomedical journals being translated cover-to-cover reached nine, and other translations under this program also increased. Responsibility for administering grants under this program was transferred from the Library to the Division of Research Grants in 1958, and the remaining responsibilities for this program were transferred the next year.

Scott Adams transferred to the National Science Foundation in 1959; John Clopine was appointed Section Chief the same year.

### 1960-1964

The NIH Library was elevated to DRS Branch status in 1960, with Mr. Clopine as Branch Chief. The Library was reorganized into Office of the Chief and five sections: Acquisitions, Cataloging, Circulation, Reference, and Translating. Photocopy services began, with "immediate and enthusiastic response"; one copier supplied 800 to 1000 pages a day, and a second was added quickly. The first copier was staffed by an attendant, who provided copies to library users in exchange for coupons. The copier emitted a green light so blinding that the attendant adopted the custom of wearing dark glasses while on duty.

The Translating Section began putting translations onto "Colitho plates" and giving out copies for retention instead of return. Some contracting of translations began because of high demand. A survey of present and future NIH library needs was conducted by Dr. Ralph Shaw, Dean of the Graduate School of Library Service, Rutgers University, including interviews with 150 intramural scientists. Many of his recommendations were implemented beginning in 1961. The book and journal collections expanded rapidly during this period. Mr. Clopine resigned early in 1961.

Dr. Malcolm Ferguson, Chief of the Medical Arts and Photography Branch, served as acting chief during a two-year interim until Jess A. Martin, Health Services Librarian of Ohio State University, was appointed Branch Chief early in 1963. As photocopying increased, lending of journals decreased. The Library's longstanding policy of permitting journals to circulate stopped within a few years, except for second copies. During this period, exhibits on medical subjects were first placed on regular display in the Library, with help from MABP.

Mr. Martin reorganized the Library into Office of the Chief and three sections: Readers Services (including Translating Unit), Technical Services, and Bibliographical Services. Bibliographical Services Section was intended to focus on the newly

developed NLM MEDLARS; it was not implemented at once, but bibliography preparation remained for a while a function of the Reference Unit, Readers Services Section. The Library had been in its new quarters only 10 years, but NIH and the Library had continued to grow rapidly. The 1963-64 Annual Report described the facilities as noisy and crowded, with public areas difficult to supervise and workspace for staff severely limited. NIH was already planning to build an addition to Building 10 including facilities specifically designed for the Library. The target date for the move was 1966.

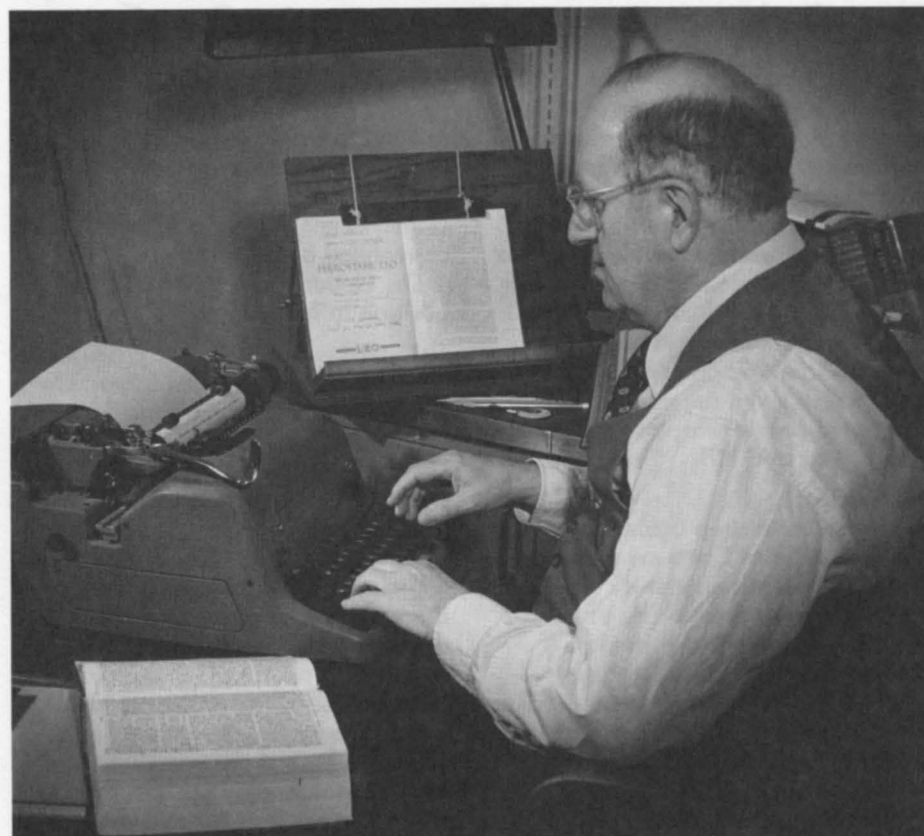
In the meantime, a crash binding program raised the number of volumes bound to 10,000 more than the normal number for a year. The Library Advisory Committee was reactivated. An internship program was begun. Book losses, a chronic problem, were reduced by physical changes permitting better surveillance. These changes, however (including an exit point), by no means secured the collection, since one end of the library was completely open for entrance or exit.

### 1965-1971

Three staff members were assigned to MEDLARS training at the National Library of Medicine so they could begin providing the MEDLARS bibliographic service to NIH investigators. The first chief of Bibliographical Services Section entered on duty early in 1966 with the primary task of providing MEDLARS searches formulated by NIH Library staff in response to requests. Work also began on automating repetitive processes including serial recording, acquisitions, cataloging, and circulation. Many staff received computer training of various kinds. A program of scientific lectures by intramural investigators was begun for Library translators and reference staff. First subject: laboratory techniques. The DCRT Library was established with assistance from the NIH Library.

The NIH Library's move to its new quarters in an addition to Building 10 was completed April 29, 1968. The new facility had more than twice as much space and many sound-reducing features lacking in the old facility. Jess Martin resigned in July 1968 to become director of the Health Sciences Library at Temple University. Seymour Taine became Branch Chief a month later. The NIH Library Advisory Committee was reconstituted with Dr. Hewitt G. Fletcher as chairman. A few years later, under the leadership of Dr. John Finlayson as chairman, it was expanded to include representatives from each Bureau, Institute, and Division, and has played a constant role in Library operations ever since.

Mr. Taine's first Annual Report reflected problems caused by a reduction in personnel ceilings,



*Sprechen Vous Italiano? When the NIH Library became part of DRS in 1956, the NIH Translating Office (established in 1938) became the Translating Unit of the Library. Then as now, the translators primarily produced English versions of foreign journal articles for NIH investigators.*

including cancellation of the internships (which have never been reinstated). In a reorganization, photocopy services were moved to the Office of the Chief and designated Library Copy Services. The Library Sections were Readers Services, Technical Services, and Reference and Bibliographical Services, and continue so to the present. MEDLINE, an online interactive service, replaced the batch method of searching. NIH computer bibliographic searching was conducted by remote terminals through MEDLINE and other databases.

Library ID cards were introduced in 1970, as was the TATTLE-TAPE Security System, which reduced unauthorized removal of books and journals by detecting a metallic strip inserted in all Library materials. The PHILSOM system (Washington University School of Medicine Library) was adopted for journal control. The Translation Unit was moved to the Office of the Chief, and the Library Copy Service was moved to Readers Services Section under the name Duplication and Audiovisual Unit. Mr. Taine resigned in August 1972.

Williams and Wilkins Company, publishers, sued the U.S. Government in 1968 for infringement of copyright through photocopy services; practices in the NIH Library were among the issues. Several members of the staff made depositions in the case. It was not finally resolved until 1975. A trial in the U.S. Court of Claims ended with a ruling against the Government; the Government appealed to the full Court of Claims. Their decision was in favor of the Government, in a four to three vote. The Supreme Court in February 1975 affirmed that decision without an opinion, on a tie vote,

four to four, with Justice Blackmun disqualifying himself.

### 1973-1981

Ruth C. Smith became Branch Chief in April 1973. The Branch Human Relations Committee was established, with representatives from each Section and the Office of the Chief. A fee was established for translations provided by contractors. An automated circulation control system was inaugurated in 1976, making use of a minicomputer and bar-coded labels. A long-term monograph weeding project was started the same year, following policies and guidelines approved by the Library Advisory Committee. A number of new data bases of interest to NIH investigators were added to the Library's search capability in 1978, including BIOSIS. The next year the number increased again, with the NIH-EPA Chemical Information System, Excerpta Medica, SCISEARCH, and many more. Ruth Smith retired in 1980.

Planning for the total automation of the NIH Library began in 1980, with assistance from the Division of Computer Research and Technology.

### 1982-1986

Carolyn Brown became Branch Chief in March 1982. The complex process of automating the Library, already begun, was a principal focus of Library staff activity for several years. Construction of a computer room began late in 1982, and the computer and array of terminals were installed the next year. A flooding of the old computer during construction provided the impetus for a rapid transition to the new. The new system became operational in April 1985; it

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## Medical Arts and Photography Branch

Continued from page 5

Unit introduced preparation of simplified technical drawings from photographs, eliminating irrelevant elements. The Plastics Unit was much involved with the new Museum of Pathological Specimens in the Clinical Center. Design and preparation of art work for slides steadily increased in the Section, and copy preparation was increasingly for slides rather than publication. Because of continuing space shortages, model and moulage activities were moved from Building 10 to the sub-basement of Building 1. Later, part of the motion picture operations were also moved there.

The Photography Section worked with NIDR on developing a clinical camera to record color changes in tissue. Animation was added to motion picture services; the first project was nerve tract routes in brain stem. During this period 3½ x 4 in. slides were being replaced by 35 mm slides. Training was emphasized, including courses taught in the Section by the heads of microphotography and motion pictures. The United States Information Agency gave worldwide distribution to an MAPB-made film on heart disease. Automated negative development and printing were introduced in the Photography Section to help cope with the ever-increasing workload. To meet research needs, a motion analyzing device was obtained, for use with high speed motion picture photography.

A Branch Conference Room was made available in FY 1964 on the fifth floor of Building 10, with a variety of audio-visual tools, closed circuit television, and a permanent exhibit on MAPB services. In FY 1965 a Motion Picture Section was formed, separate from the Photography Section; Roy Perry became the first Chief. Vern Taylor became Chief of the Photography Section. The next year, Medical Arts Section was replaced by two sections: General Illustration, under Ron Winterrowd, and Medical Illustration, under Howard Bartner. George Marsden had retired as Medical Arts Section Chief some time before.

General Illustration Section provided central art services by designing scientific exhibits; producing art for animated motion pictures, slides, and silk screened materials; and planning design and layout of publications. Medical Illustration Section provided surgical, pathological, ophthalmological, biological, and dental illustrations; charts and graphs; technical illustrations; and anatomical models.

### 1966-1970

MAPB (to its joy) was freed from responsibility for warehousing, shipping, setup, striking, receiving, and extensive repairing of exhibits. It continued to design them and oversee contracting and construction. One 1966 exhibit was requested and obtained by the Smithsonian Institution for long-term showing.

The FY 1966 Annual Report called lack of space the Branch's most pressing problem, exacerbating the problems caused by physical separation of Branch components and the "dismal" location of the Motion Picture Section in a sub-basement. Motion picture production was high, however, especially two new kinds of scripted films: researched reports and "health vignettes" prepared for the Office of Research Information. In 1967 MAPB provided more art and photographic services than in any previous year. Late in that year, Mr. Ferguson transferred to the National Library of Medicine. Dr. William DeWitt, Director, DRS, served as Acting Branch Chief. He named Arthur Moore, who had been working on MAPB films as a contractor, as Chief of the Motion Picture Section. The next year, Charles C. Shinn was named Branch Chief. In 1968 the number of completed jobs was again a new high—61 percent higher than in 1965, although the number of employees was the same as in 1965. The Annual Report made special mention of a life-size, flexible plastic eye model that had required two years of work involving many personnel.

In August 1969 the Branch office and all sections except Photography moved to the newly built quarters on

### Them Was the Days: Medical Arts and Photography

In 1958 the Medical Arts Section moved from Building 1 to the A wing of Building 10, near the Clinical Center Director's office. In those years, some exhibits were always on display in the Clinical Center lobby. One day Walter Ashe was hurrying with an armload of supplies to make some repairs on an exhibit. He collided with Dr. Jack Masur, Director of the Clinical Center, who was coming out of his office. Walter's load of paints and other repair items was scattered around the floor. He looked up in some embarrassment at Dr. Masur, who was tall and impressive in appearance. Dr. Masur simply said, "Old hospital hands use the middle of the hallway; I could have been carrying a bedpan."



Thirty Years Ago. Don Jones, now Chief of the Camera Unit, Photography Section, MAPB, is one of the few current DRS employees who were in the Division during its first year. Here Don is shown at work in 1956.

the B2 level of the Building 10 Library wing. A central work reception area was established. Standardization was introduced in many areas such as publication sizes and chart formats. The new motion picture studio was soundproofed, ending the need for renting such facilities. Vern Taylor resigned as Photography Section Chief, and was replaced by Charles Mattes. Mr. Shinn was selected in FY 1970 to serve as Visual Communications Projects Officer in the Office of the Director, DRS. Personnel and budget cutbacks presented problems throughout FY 1969 and FY 1970. Emphasis was placed on streamlining work methods and obtaining labor-saving equipment.

### 1971-1978

Arthur M. Moore was promoted to Branch Chief in FY 1971. Computer-generated graphics were introduced, following an experimental program with assistance from DCRT. Rotational training, primarily among units of the General Illustration Section, produced more diversification

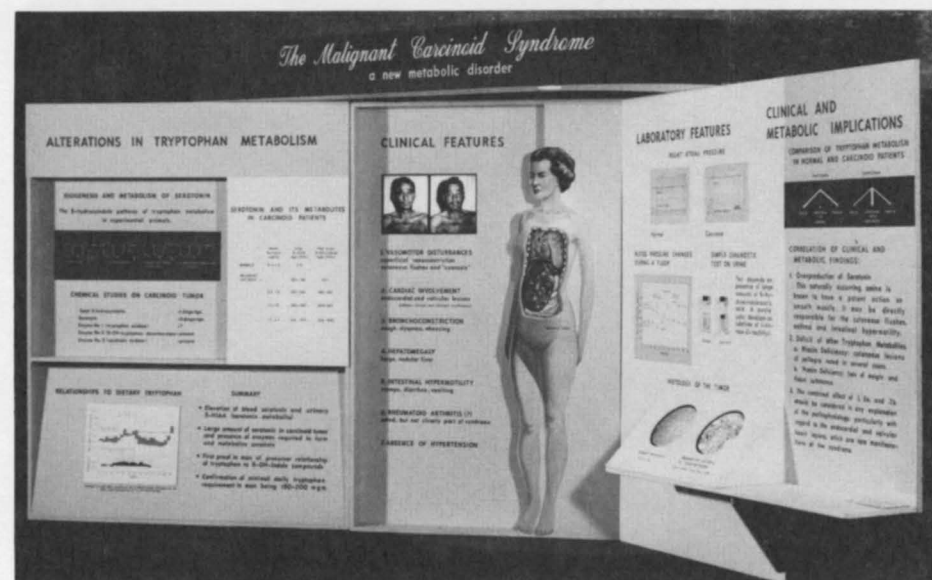


New Kid. Howard Bartner (white coat) was a new addition to Medical Arts Section's Medical Illustration Unit in 1958. Fellow staffer Roy Marsden became Medical Arts Section Chief when MAPB was formed two years later.

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Glad to see ya! Photography (left) and Medical Arts work reception areas in 1968. The employee at Photography Section's "express window" shows interest in her work, but can't match Doris Marshall's unbounded enthusiasm for Medical Arts.



Prizewinner. Walter Ashe's exhibit on malignant carcinoid syndrome won two prizes in 1955. Exhibits made up a much larger part of Medical Arts work in that period than it does now.



## Veterinary Resources Branch

Continued from page 6

and NIH Animal Center. Pilot study of dog and cat breeding begun.

1964. Dr. McPherson assigned responsibility for gnotobiotic operations. Dr. Cobert LeMunyan named Chief, Animal Production. Dr. Carl Hansen comes to Genetics Unit, replacing Dr. Harold Hoffman, who transferred. Dr. Stephen Potkay named Chief, Experimental Surgery Section (formerly part of Animal Hospital Section). Animal Production Section produces more than a million animals for the first time, but demand is so high the number of small animals purchased from outside is also the highest ever, though still under 10 percent. Germ-free rearing program passes from pilot operation to small production facility. Branch consultancy with investigators on animal models, animal health growing rapidly. Burros become principal animal for producing specific antisera (manageable and good producers). Severe outbreak of simian hemorrhagic fever in Primate Unit of Animal Hospital Section.

1965. New canine and farm animal units at NIH Animal Center begin operations. Dr. Potkay also named Acting Chief of newly formed Animal Biologics Section and Animal Conditioning Section at the Center. Planning on actions to solve longterm problems with procurement of dogs meeting research needs; conditioned dogs released to investigators this year number 4,200.

Dr. Anton Allen publishes finding of Tyzzer's disease in rabbits (first known case in animal other than mouse); Dr. James Ganaway begins work on Tyzzer's disease leading to international reputation. Flock of chickens free of Resistance Inducing Factor (RIF) housed in Building 14G after rederivation by artificial

insemination (previous flock became contaminated).

1966. Branch accredited by the American Association for Accreditation of Laboratory Animal Care (AAALAC); accreditation has been retained ever since. Program begins to supply blood for canine research projects from a canine donor colony at the NIH Animal Center, thereby greatly reducing the need for dogs in the intramural programs. Research contract negotiated for producing some 800 American foxhounds per year for use as research subjects; colony established. In-house dog and cat breeding activity at the NIH Animal Center enlarged. Dr. McPherson transfers. Animal Production Section renamed Rodent and Rabbit Production Section.

1967. Dr. Byrne transfers; Dr. R.D. Zinn promoted to Branch Chief. Dr. LeMunyan transfers; Mr. Richard Pierson Acting Chief, Rodent and Rabbit Production Section. Staff nutritionist, Dr. Joseph Knapka, added to staff of the Section; nutrition research intensified.

1968. Dr. Samuel Judge named Chief, Rodent and Rabbit Production Section; Dr. Amos Palmer Chief, Animal Conditioning Section. Annual Report stresses that animal production facilities remain the same while laboratories at NIH increase in number: Result: more problems in meeting needs. Random source dogs issued number 3,612, the fewest since 1960. Number is lower because the blood donor colony reduces the need, and the conditioning period has been lengthened from 30 to 45 days. Drs. Palmer and Allen, with Drs. Tauraso and Shelokov of the Division of Biologics Standards, publish clinical, pathological, agent isolation/characterization articles on simian hemorrhagic fever.

1969. Dr. George Clarke named Assistant Branch Chief. Dr. Zinn



**Poolesville Planning.** Plans for the NIH Animal Center phase II buildings are reviewed in 1967 by (l to r) Drs. Stephen Potkay, Ray Zinn, Wendell Nieman, and William DeWitt.

transfers; Dr. Anton M. Allen, Acting Chief. Non-inbred rat colonies established in a barrier environment to increase the security of foundation colonies and permit production of rats free of chronic respiratory disease. Intensive research on animal foods; food specifications revised. Blood donor dog colony expanded; need for dogs reduced 1300 below last year's.

1970. Dr. Joe R. Held, Chief. Animal Center Section formed; Dr. Amos Palmer named Chief. Lowered personnel ceiling necessitating increased purchase of commercial animals, with resultant higher overhead. Limited primate breeding program begun. Rodent isolator facility completed at NIH Animal Center. Breeding nuclei of NIH animal strains supplied to 53 authorized investigators: 39 in this country and 14 abroad.

1971. Experimental Surgery Section renamed Experimental Surgery and Clinical Medicine Section; Dr. George L. Clarke named Chief. Animal Disease Investigation Service begun as part of the Office of the Chief, serving NIH laboratories and investigators. Program begun to assist investigators in obtaining new animal models to meet previously unfulfilled research needs.

1972. Dr. Held named Director, DRS. Name of Branch changed to Veterinary Resources. Dr. Robert A. Whitney, Jr., named Chief. Dr. David K. Johnson named Chief, Experimental Surgery and Clinical Medicine Section.

Primate Quarantine Building, NIH Animal Center, occupied. Open formula rat and mouse ration, developed in the Branch, introduced in conventional colonies; most investigators also convert to it, causing significant savings in NIH feed costs.

1973. Dr. Palmer transfers; Dr. Potkay named Chief, Animal Center Section. Nude mouse introduced into Genetic Resource.

1974. NIH Rodent Catalog published. Perrine Primate Center opened, following cutbacks in rhesus monkey exports from India. Experimental Surgery and Clinical Medicine Section renamed Veterinary Medicine and Surgery Section, consisting of Comparative Medicine Unit (Dr. Richard Killens), Surgery Unit (Dr. Norman Hayes) and Primate Unit (Dr. Johnson). Animal Disease Investigation Service becomes part of Comparative Pathology Section.

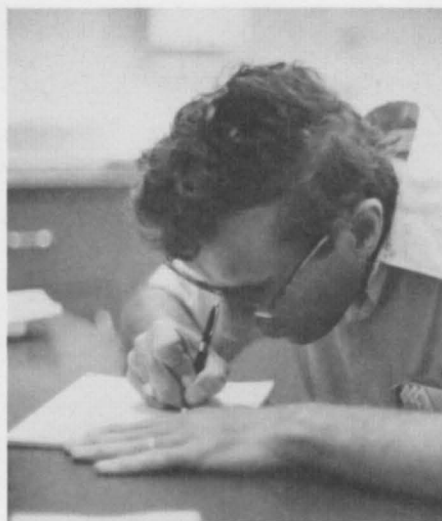
1975. VRB rodent breeding colonies designated World Health Organization Collaborating Center, in recognition of their importance as an international genetic repository. Rodent and Rabbit Production Section renamed Small Animal Section (SAS). Primates, vital to biomedical research and testing, continue becoming more difficult to import. Assistant Secretary for Health establishes Interagency Primate Steering Committee (IPSC) with Director, DRS, as chairman, VRB supplying staff support. IPSC fosters domestic breeding, conservation.

1976. Media and Glassware Section transferred to Environmental Safety Branch, DRS. Dr. Judge named Chief, Animal Center Section (ACS); Dr. Potkay Chief, SAS. NIH use of dogs lowest of any year yet recorded; no random source dogs issued. Innovative socialization program for NIH Animal Center puppies begun by Dr. Thomas Wolfe, VRB staff animal behaviorist, to give colony dogs experience with humans and eliminate fears.

1977. Genetic Monitoring Unit established in Comparative Pathology Section, bringing more sophisticated, thorough protection to VRB rodent colonies and NIH laboratories; Dr. Harold Hoffman, Chief. Longtime goal achieved of developing open formula diets for all rodents and rabbits maintained in the Small Animal Section. Open House at Animal Center, Poolesville, for area



"He's healthy, but he'd look better with a crew cut." Dr. William Gay identifies these young men at work in the Animal Hospital Section (around 1960) as Dr. Donald Andrews (rear left), the first veterinarian assigned to the Poolesville Animal Center, and (l to r) Leonard Marcus, Bob Fleisman, and Al Shoey, co-step trainees.



**Memory Lane.** Bob Benson took color photographs of many VRB coworkers before he retired in 1979 after 19 years in the branch; here he caught Bob Wolfes hard at work at the Animal Center.

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## Biomedical Engineering and Instrumentation Branch

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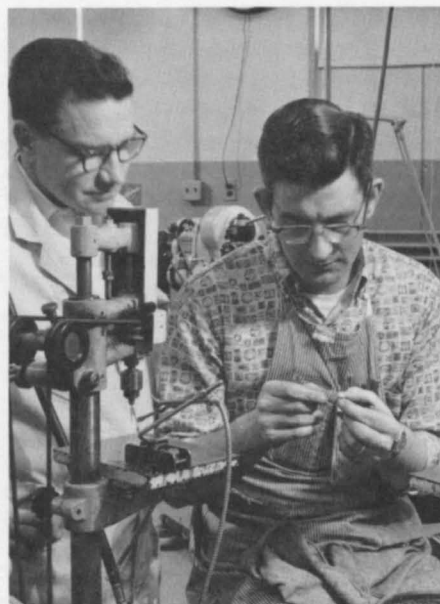
miniature toposcopic catheter underwent its first tests in humans, bringing a chemotherapeutic agent directly to a brain tumor. BEIB sponsored its second NIH Consensus Development Conference: "Clinical Applications of Biomaterials." Laser research brought BEIB advances in noninvasive assessment of blood platelet viability for blood banks and in measuring velocity and flow rates of red blood cells in microvessels. Other advances included localized hyperthermia with microwave applicators; a miniature microtome fitted inside a scanning electron microscope for automated sectioning of tissue for analysis; low light level and special purpose video systems; electro-optics, with particular emphasis on laser angioplasty and photo-dynamic therapy for cancer treatment; microprocessor and personal computer-based "smart" instrumentation systems; and neuro-

magnetic localization of neural activity in the brain.

Scientific Equipment Services established an employee productivity group to provide management with information on employees' point of view on how to increase efficiency.

A workshop on cardiovascular dynamics, jointly sponsored by NIH and INSERM (French National Institute of Health and Medical Research) was held in September 1985, coordinated by BEIB; the workshop was the first formal activity under the heading of instrumentation and biomedical engineering in the NIH-INSERM program of cooperation in the biomedical sciences.

Construction began in 1986 of the NIH *In Vivo* Nuclear Magnetic Resonance (NMR) Research Center; BEIB staff will coordinate activities in the Center, where researchers from various Institutes will conduct projects.



**Model Makers.** Lee Kitrell (left) and John Mason of BEIB at work in the mid 1960s on parts of a molecular model of sickle cell anemia for an NIH investigator.



**Show me!** DRS secretaries visited work areas in various DRS branches during 1976 to get to know the Division better. James Sullivan of the Precision Instrument Unit in BEIB was among the hosts.

## The NIH Library

Continued from page 8

includes an automated catalog that not only identifies items in the collection but also tells users whether any particular item has been checked out or is otherwise currently unavailable. The new system includes a circulation system that enables the staff to count usage of individual items in the collection. This capability supplements recommendations of subject experts to determine which journals will be kept and which weeded. In 1986 the catalog system also became available to NIH staff by telephone lines.

While automation was prepared and implemented, other improvements proceeded. The Library was repainted and new carpeting installed; both the

journal collection and the book collection were weeded under a policy approved by the Library Advisory Committee; a policy was adopted of retaining most older journals (pre-1955, initially) only in microform; an NIH commitment was obtained of additional space for the Library, to be used for more reader space; photocopying service was reorganized and greatly improved; regular classes were begun on "MEDLINE for the Health Professional" and on use of the Library's automated catalog; workshops were given to assist NIH staff in selecting software to aid in such tasks as preparing for publication. The present collection size

is approximately 80,000 monographs and 183,000 bound journal volumes.

Library automation has brought additional benefits besides the obvious ones. For example, in the first year, analysis of usage patterns in photocopying identified 65 journals photocopied so infrequently that the Library's second-copy subscriptions were judged unnecessary; the subscriptions were changed to single-copy, and the savings were used to pay for additional copies of the most-used journals. Reserved books are now being returned much more quickly, because when an NIH staff member requests a book that is charged out to another staff member,

the system issues a recall the day after the due date of the requested book. A hold is placed on the borrower's right to borrow other materials until that book is returned. Because the system now works better, many more people are using it.

Using both advanced technology and personal attention, the NIH Library is ready for its eighty-fifth year of service to NIH research.



**Hansen and Company.** Building 41, being constructed in 1968, must have been of special interest to DRS Director Chris Hansen (left), shown with Ross Holliday, Chief of the DRS Plant Engineering Branch (PEB), and Al Perkins of the PEB Engineering Design Unit. Besides the responsibility of PED for construction at NIH, the DRS Environmental Services Branch was involved because the new NCI building was designed for containment of dangerous viruses used in research.



**Prizewinners All.** Five MAPB artists received ten awards at the 1968 Federal Artists and Designers Society meeting. On the left are Bill Bowman, Linda Brown, and Jerry Pavey; on the right are Elaine Hamilton and Ron Winterrowd. They are flanking Charles Shinn, Chief, MAPB, and John W. Macy, Jr., Chairman, U.S. Civil Service Commission.



## Medical Arts and Photography Branch

*Continued from page 9*

and improved morale. FY 1972 brought further reductions in personnel with an increase in demand for services; contracting out of work was increased 75 percent, along with continued commitment to new technology. For example, photo-micrography output was doubled during the year with new equipment.

The next year contracting out was doubled. An effective oversight and quality control system was established.

Edward Singleterry became Photography Section Chief in 1974. Contracting out increased much more slowly in FY 1974 and 1975, but still reflected increased demands for MAPB services. The Photography Section area was completely renovated, bringing better efficiency and turnaround times. The General Illustration Section was reorganized and renamed Design Graphics Section. The Graphics and Drafting Units were combined under the name "Graphics." A coordination program began on graphic imaging, to more effectively identify work done at NIH to the scientific community and general public. Al Laoang's portrait of Dr. Charles Drew was officially unveiled at a Masur Auditorium ceremony and hung near the entrance to the Clinical Center blood bank. Delivery time of normal photographic work was reduced in FY 1976 from seven to five working days. Graphics standards for statistical materials produced by the Branch were completed, as part of the drive to coordinate graphic imaging, improve communications, and economize by eliminating preliminary design problems. A Graphics Design Manual was produced and distributed widely throughout NIH. Aware that MAPB customers were drastically increasing their own costs by ordering rush jobs because they had failed to plan and act in time, the Branch began a continuing effort to point out this problem and offer early planning services.

Additional technical improvements in the Photography Section were accompanied by formal training for staff. In FY 1978 Graphics' normal turnaround time was also set at five workdays. Both Photography and Graphics Sections also offered 24-hour emergency service.

### 1979-1986

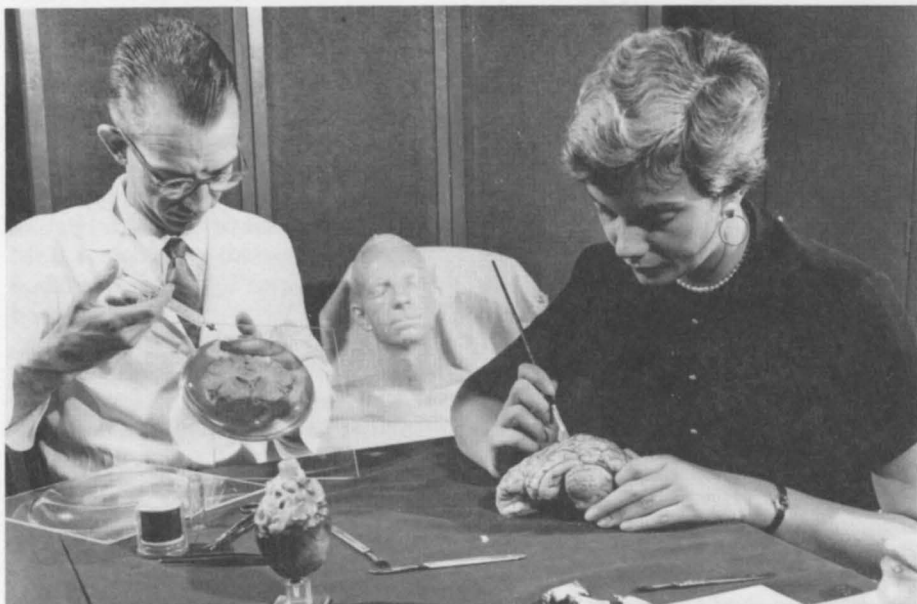
At the suggestion of Art Moore, the DRS Annual Report became a printed document designed by the Branch. Graphics work produced by Design Graphics Section artists won five first-place awards in the Annual Exhibition of the Art Directors Club of Metropolitan Washington in 1979. Art Moore retired in 1981; Ron Winterrowd became Branch Chief. In 1982 for the first time in 10 years demand for services did not rise, largely because of inflation, budget constraints, and a reduction of Federal publications. To help control costs, MAPB required bids on all contracted graphics work, rather than only on jobs above \$500, as required by regulations. Staff visited laboratories and section, by invitation, to explain ways of reducing costs. An MAPB Advisory Committee of intramural scientists and information specialists was established. The Branch was reorganized in 1985 into Design Section (Linda Brown, Chief), Graphics Section (Pat Lewis, Chief), Photography Section (Ed Singleterry, Chief), and Medical Illustration Section (Howard Bartner, Chief). The Motion Picture and Special Events Unit (Donna Bonner, head) was established in the Office of the Chief, then transferred to Graphics Section. MAPB posters were hung permanently in the NIH Director's Conference Room and the Clinical Center corridor outside the NIH Library. Demand for MAPB's services remained heavy and steady, including many contributions to the NIH centennial.



Inez Demonet, Medical Arts Section Chief, plans decoration of the Clinical Center lobby with assistance from Elaine Hamilton (right) and other staff (1959).



Photo Exhibit. The Photography Section mounted an exhibit in 1966, in the Clinical Center. Shown (left to right) are Irving Bragg, Robert Pumphrey, and Section Chief Roy Perry.



Brainwork. Phil Joram and Helen Orem of the Medical Illustration Unit, Medical Arts Section, work on a cerebral project in 1956, DRS's first year.



## Veterinary Resources Branch

*Continued from page 10*

residents and other visitors; another open house at VRB Bethesda buildings, focused on new VMSS facilities.

**1978.** India stops all export of rhesus monkeys, causing a severe shortage, with implications for NIH and all biomedical research. IPSC issues National Primate Plan. Dr. Potkay named Deputy Chief, VRB; Dr. William Watson, Chief, SAS. Comparative Pathology Section is reorganized into three units: Pathology, Microbiology, and Genetics. Plasmapheresis techniques with domestic livestock introduced to supply large quantities of plasma without increasing the number of animals used. Monitoring research animals for genetic type and microbiological contamination increases dramatically; methods becoming more and more sophisticated.

**1979.** Primate quarantine facilities at NIH Animal Center begin being used for research holding and breeding. Ectromelia (mousepox) outbreak in an Institute animal room, caused by animals that did not undergo VRB quarantine, leads to major disruption of intramural projects, reinforces importance of observing quarantine, cell-line introduction procedures.

**1980.** New *NIH Rodent Catalog* published with information on 150 strains and stocks.

NIH open formula laboratory animal diets being widely used throughout the scientific community. Bastrop Chimpanzee Resocialization and Breeding Center, sponsored by IPSC, opens under VRB contract. Cryopreservation of mouse embryos begun, to enhance the protection, efficiency, and utility of the Genetic Resource.

**1981.** Dr. Hansen, staff geneticist, develops mouse strain both B-cell and T-cell deficient as a model of complete immunodeficiency. VRB begins housing and care of monkeys belonging to Institute for Behavioral Research (IBR) when NIH accepts custody at request of Maryland authorities pending legal action involving an IBR scientist using the animals.

**1982.** Building 14B renovated for use in rodent holding for investigators, as trend continues toward purchase of rodents under contract, with VRB production focused on investigators' special needs. VRB staff involved in several NIH committees concerned with proper care and use of animals.

**1983.** Holding of rodents and rabbits on experiment begun, both in conventional and gnotobiotic settings. Three Small Animal Section units reorganized into two: Research Support and Production. Primate Quarantine Unit, Animal Center Section, renamed Primate Unit.

Manual Issuance 3040-2 issued, expressing NIH policies on use of animals in intramural programs. Assistant Secretary for Health renames Interagency Primate Steering Committee as Interagency Research Animal Committee (IRAC) with expanded membership and responsibilities. Dr. Thomas Wolfe named IRAC executive director and secretary, NIH Animal Research Committee.

**1984.** Dr. Joe R. Held retires as Director, DRS, and is named Director, Pan American Zoonoses Center. Dr. Robert A. Whitney, Jr., named Acting Director, DRS; Dr. Potkay, Acting Chief, VRB. VRB directs efforts toward reducing costs of services and increasing efficiency. Dr. James Ganaway and associates in Comparative Pathology Section identify the organism that causes chronic respiratory disease of rats; temporary name "celia-associated respiratory (CAR) bacillus" assigned. National Chimpanzee Plan, emphasizing a breeding program to prevent loss of chimpanzees to biomedical research within two chimpanzee generations, approved by IRAC and submitted to Director, NIH.

**1985.** Dr. Whitney named Director, DRS; Dr. Potkay, Chief, VRB. Small Animal Section and Carnivore Unit, Animal Center Section, conduct special studies of users' plans and needs so as to tailor their programs to those needs. NIH full-cost recovery actions bring drastic rise in many VRB charges, though not in actual Institute expense for VRB services. Perrine Primate Center closed, colony sold, because of reduced needs for rhesus monkeys in intramural projects. Director, NIH, approves National Chimpanzee Plan, authorizes NIH request for funding.

"U.S. Government Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training," developed by IRAC, are published in the Federal Register by the Office of Science and Technology Policy and are declared the basis for PHS policy on use of animals by awardee institutions and for the revised *NIH Guide for the Care and Use of Animals*. NIH begins accelerated drive to have all Institute animal programs and facilities meet requirements for AAALAC accreditation by the end of FY 1987, with formal accreditation as soon as possible thereafter. Heavy involvement of NIH Animal Research Committee staff and other VRB staff in this drive, and in training course for intramural investigators in animal care and use.

**1986.** As DRS celebrates its 30th anniversary, VRB has its 38th anniversary as an NIH-wide service organization. Resources of the Small Animal Section are increasingly directed toward providing and supporting research holding activities,



**Poolesville Beginnings.** John Osborne (shown around 1960) was the first resident animal caretaker at the NIH Poolesville farm. He and his wife were both later struck by lightning at the farm. Osborne had his arm around his wife's shoulder at the time; an image of his arm was burned into her skin. She was also deafened. A rake in Osborne's other hand was shattered. Both recovered from their injuries.

with a further reduction of in-house production. In production, emphasis is placed on providing investigators with unique and hard-to-raise animals in limited quantities. Fifteen macaque monkeys, housed at the NIH Animal Center and provided with veterinary care at the request of the Montgomery County Circuit Court after their seizure by the State in 1981, are relocated to the Delta Regional Primate Center in Covington, Louisiana.

The IRAC Office staff coordinates the new NIH Animal Awareness program, which includes a series of

posters in every building, conveying some theme about animal care, and will provide various kinds of communications with NIH employees on issues relevant to animal care and use. In October, IRAC and NIH Animal Research Committee staff responsibilities are transferred out of VRB. At that time the Office of Animal Care and Use is established in the Office of the Director, NIH. It is headed by the Director, DRS, as an added responsibility; IRAC personnel are the nucleus of the staff, fulfilling their previous responsibilities as well as new ones.



**1975 Group Award.** The design and graphics staff ("General Illustration Section") of MAPB received a group award in 1975. Dr. Joe R. Held, Director, DRS (left), and MAPB Chief Art Moore (right) flank the awardees (l to r): Pat Lewis, Estelle Trope, Helen Smith, Donna Bonner, Al Laoang, Helen Orem, Elaine Hamilton, Pauline Nargizian, Jackie Drake, Lee Nance, Linda Brown, Betty Hebb, Sam Mills, Paul Mortillaro, Dick Barlow, Chuck Gallis.



## Research Services Cover Everything

*The following article about DRS appeared in a special edition of the Montgomery County Sentinel (May 16, 1963) devoted to the National Institutes of Health. It shows the make-up and responsibilities of the Division seven years after it was established in 1956, when DRS still contained the components that were precursors of DCRT, the Division of Engineering Services, and the Division of Safety. Note: the article's awestruck tone comes from the Sentinel, not from DRS; however, who's arguing?*

It might be called the specialist in a thousand and one jobs; the keeper of keys; the catch-all; or the do-almost-anything division. But it isn't. It masquerades under the non-confounding name of Division of Research Services.

It can build a radio not much larger than a thimble, or photographic equipment as large as a room; manicure the shrubbery; trim the trees; or fashion a tiny plastic valve to be transplanted in the human heart.

The improbable it did yesterday. The impossible may be scheduled for tomorrow. Today, it works at its job of breeding and raising over a million small research animals every year. Possibly, it is going into action to import a few dozen monkeys out of Africa, or buying a chimp from an American zoo.

It runs the big NIH electronic computers program; repairs the network of roads through the Institutes' 306 acres; designs and produces fine precision instruments, some never seen before but designed to fit a particular described need of particular scientists and laboratory technicians.

It runs the physical plant. Every day, it hauls more than a thousand garbage cans to the big NIH incinerator bearing debris from animal kennels. It employs glass-blowers to create special laboratory glass.

It's the most fabulous, goldarnest, cotton-pickin'est place in the world. If this story of research appears to be approaching lightly a very important and serious piece of business at the National Institutes of Health, it should be remembered that no mere reporter could approach and leave the Division except in a flabbergasted state of utter amazement.

The foregoing, however, isn't the full story . . . even one-hundredth of the story. In polite, plain phraseology, one official description of the duties and functions of the Division of Research Services says this: "The Division of Research Services provides facilities, equipment, and a wide variety of scientific and technological services for the needs of the medical investigators and research administrators at NIH."

Never was there such a simplification of such diversified functions in or out of government.

For example, when there was need in two of the institutes, Division bioengineers and technicians came up with an apparatus that first generates electric pulse trains to stimulate cortical areas of the brain, then displays and photographs the resulting cell discharges on an oscilloscope.

They developed an automated instrumental system with which sequential functions in clinical pathology can be televised and photographed at precise time intervals.

On top of things like these, Research Services runs the 500-acre animal farm still under development at Poolesville. It has medical artists and photographers who provide vital documentations of research through clinical illustrations and photography. It runs the NIH medical library, one of the best in the world.

It employs some librarians and translators to help researchers commit findings to the science world via papers and publications. They even track down obscure written clues to research problems.

Sanitary engineers of the Division pioneered the efforts to produce important germ-free animals at NIH for research purposes; to sterilize animal food and equipment. They designed lightweight, portable chambers for transport and delivery of those animals. They even converted NIH facilities for large-scale production of germ-free and specific-pathogen-free animals—some kept so germ free, even their attendants must wear special sterile clothing on their jobs.

When it comes to the planning of floor space use and the design of new laboratories in new buildings, this also is the bailiwick of Research Services. Its staff includes electronic engineers, architect-engineers, and civil engineers. Its bioengineers have had extensive training in the life sciences as well as in basics of chemistry and physics.

Also on the personnel roster are biologists, computer programmers, entomologists, geneticists, veterinary scientists, animal husbandmen, carpenters, electricians, glassblowers, horticulturists, plumbers, tree surgeons, varitypers, and welders.

If a scientific worker in one of the institutes needs bacteriological

culture media, he orders it from Research Services. He orders his laboratory glass from the same place. In addition, he can order inbred and exotic species of laboratory animals from its animal colony. Name it: rat, mouse, rabbit, hamster, monkey, chimp, farm animal, a snake or two; the Division has it or can produce it on schedule.

New approaches to the wonders of computer methodology have been developed by the Division in order to devise new computer techniques applied to solution of biological and chemical problems. Its central data processing service includes a multipurpose computer with significant advantages for adapting computer techniques to rapid recordation and retrieval of lab data; to the simulation of biological systems for testing potentiality of prediction on the testing of mathematical hypotheses, and to numerous other research uses still being explored.

The first man or woman ever to utter the phrase "I could write a book" must have had something like the Division of Research Services in mind.

Chief of the Division is Chris A. Hansen. He recites the facts like a big-business executive with a hand on all the details. He doesn't accept the premise that the Division he heads is one of miracles, accomplishing the impossible as well as the improbable—to say nothing of the thousands of housekeeping details of NIH. He puts it this way: "We do our job."



**Building 12A Nearing Completion.** Building 12A was already occupied when this picture was taken in 1965, but obviously many changes were made later. The current west-side entrance was then a loading dock. Three other entrances have been done away with.